Assessing Language or Content? A Systematic Review of Assessment in English Medium Instruction Classrooms in Different Contexts

Thanakrit Thippayacharoen [a], Chonlatee Hoofd [b], Napat Pala [c], Banchakarn Sameephet [d,*], Bhirawit Satthamnuwong [e],

[a] thanakrit.thi@kkumail.com, English Language Department, Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand
[b] chonlatee.h@kkumail.com, English Language Department, Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand
[c] napatpala@kkumail.com, English Language Department, Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand
[d] banchasa@kku.ac.th, English Language Department, Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand
[e] bhirawit@kku.ac.th, English Language Department, Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand
* Corresponding author, banchasa@kku.ac.th

ABSTRACT

Research on English Medium Instruction (EMI) is rapidly increasing and well-documented worldwide; however, recent studies in EMI have given less emphasis on assessments in EMI classrooms. Indeed, assessment plays a significant role in informing teaching and learning competencies, but what to assess and how to assess are questions which have been neglected in EMI research. The controversy continues over whether it is necessary to assess language in content learning. This systematic review explores assessment practices in EMI centering on objectives, roles, and tools of assessment. The PRISMA flow diagram screening process was employed in the study selection to enhance the transparency and scientific validity of this review. Consequently, we identified assessment implementation for different purposes and highlighted critical findings based on an in-depth analysis of 13 studies on EMI assessments in different contexts. Findings revealed that assessments of English proficiency and content comprehension are widely found in formative and summative assessments. Although teaching English was not a primary goal of EMI, assessments of English skills were practiced in many contexts. This study provided a greater understanding of a holistic picture of EMI assessments that can benefit related stakeholders in selecting appropriate assessments for specific purposes in EMI classrooms. Moreover, this study called for further research on the empirical evidence of EMI assessments in diverse educational settings.

Keywords: English medium instruction, EMI assessment, formative assessment, summative assessment, systematic review

Introduction

English Medium Instruction (hereafter EMI) implementation is a policy decision to offer academic subjects taught in English rather than home languages. Therefore, EMI is not merely a linguistic or pedagogical shift, but a geopolitical, economic, and ideological phenomenon with significant implications for university ecosystems (Fenton-Smith et al., 2017). In addition, the implementation of EMI is continuously expanding globally and teaching content through English is a growing global phenomenon (Curle et al., 2020; Macaro, 2018). Thus, the effectiveness of EMI adoption requires assessment, a component which has always played an essential role in most educational practices.

According to Black and Wiliam (2009), assessment is the process of collecting evidence of actual learning and comparing it to the expected achievement of the course objectives. The term assessment refers to the process of determining the effectiveness of teaching and learning. Assessment, which is used to evaluate content learning outcomes in EMI (Rose et al., 2019), has always been a matter of concern for instructors and students. This is because the outcomes of content learning are usually dependent on the competency of both agents. According to Wilkinson and Zegers (2006), there is an assessment gap in EMI in higher education (hereafter HE) due to assumptions regarding EMI instructors' competence to teach academic content in English and students' ability to learn through English. The instructors are sometimes unable to assess actual academic content competency when they rely heavily on English skills. Low English proficiency does not always translate to poor content understanding or instruction. Thus, assessment is likely to be the most critical process in effective instruction since evaluation is the only element which allows us to determine whether a particular sequence of instructional activities has resulted in the desired learning outcomes.

EMI research is proliferating, and numerous studies have focused on policies, challenges, and attitudes. Up to now, far too little attention has been paid to EMI assessment (Lasagabaster, 2022). From practical perspectives, this is because considerable uncertainty remains over what to assess and how to assess students' performance. Even though the primary goal of EMI is for students to master the content, no language goals are specified (Unterberger & Wilhelmer, 2011). The process may or may not include the underlying goal of improving students' English skills (Brown & Bradford, 2017). Thankfully, the integration of content and language occurs naturally in EMI learning (Dafouz & Smit, 2012). In other words, while students are expected to learn academic subject materials in an L2, their English proficiency is assessed through evaluative tasks. However, because students must respond to assessment assignments in English, students' English proficiency may unexpectedly play a role in the assessment process. As a result, students' ability to comprehend and answer exam questions in English may impact their academic performance. Consequently, the distinction is difficult to make between whether students do not understand the content or whether their performance is inhibited by limited English skills.

This paper aims to explore current EMI assessment practices in classrooms. It will shed light on the objectives, roles, and tools of EMI assessment. The contributions of this study will serve related stakeholders in various aspects. Firstly, the findings of this study will inform policymakers and authorities about a resource which is available to establish clear assessment criteria to support EMI operation. Secondly, this study highlights several assessment types designed for different purposes that can be employed as formative and summative assessments. Lastly, the evidence of the assessment roles is beneficial for further study to extend the effectiveness of assessment instruments.

Review of Literature

History of English Medium Instruction

In a globalizing world, English has increasingly gained popularity at universities worldwide. The HE sectors have contributed a significant and potentially permanent shift towards supporting student and staff mobility, encouraging international collaboration and networking for research, and the creation of numerous educational programs. Furthermore, many universities are invested in raising their position within global ranking systems (Dafouz & Smit, 2020). "[S]tudying in the medium of English may offer a competitive advantage in the workplace" (Talaue & Kim, 2020, p. 321). This has led to an exponential rise in EMI programs, the growth of which has been strikingly pronounced. Estimating EMI adoption, Dearden (2014) found that over 90 percent of private universities and more than 78 percent of public universities around the globe have implemented EMI.

EMI has seen a significant increase in Europe. Since the 1990s, EMI has been recognized as a crucial element in EU nations' plans for globalizing their universities' curricula (Curle et al., 2020) due to the Bologna Agreement. This agreement has highlighted the freedom of movement for HE students across Europe. Moreover, since the early 2000s, numerous programs have been climbing noticeably up the ranks, especially at the master's level and in business and science subjects (Lasagabaster, 2022). Wächter and Maiworm (2014), for example, emphasized a nearly 1,000 percent growth rate in EMI in Europe between 2001 and 2014. Throughout this increase, EMI has been driven by institutional, national, and global factors at play in Europe.

With the intensely competitive branding of HE in recent years, Asian countries (e.g., China, Japan, Korea, and Taiwan) have accelerated their progression to EMI distribution in their universities for many purposes (Hu et al., 2014). Much of this expansion is due to national HE plans in these countries, emphasizing EMI as a critical strategic aim across academic disciplines. Notable examples include China's Project 211 and Project 9851 (Rose et al., 2020), and Japan's Global 30 and Top Global University projects.

In China's higher education throughout the past two decades, the number of EMI programs has increased significantly (Deng & Wannaruk, 2021).

Likewise, South Korea and Taiwan have also revealed a similar jump in EMI programs through individual institutional plans. Over 9,000 EMI programs were presented in South Korea (Byun et al., 2011), and 92 universities in Taiwan provide complete degree programs conducted in English (Yang, 2015). Because of this expansion, educational authorities in these nations affirmed an opportunity to build independent EMI programs. As a result, EMI has become what Macaro (2015, p. 7) calls an 'unstoppable train'.

Language and Content Learning in EMI

Although language learning is considered to be an implicit outcome of EMI programs, some studies have discovered that language teaching rarely happens in EMI classrooms (see Moncada-Comas & Block, 2021). Content instructors at some universities do not view themselves as language instructors even though they teach in English. Similar findings have been documented in other studies (e.g., Moncada-Comas & Block, 2021; Sameephet, 2020). There is conflicting evidence about the advantages of language learning during EMI programs, with some studies suggesting a marginal boost in language learning (Yang, 2015) and others asserting that EMI has no impact on learners' English proficiency (Hu et al., 2014). Due to a lack of empirical studies on assessments, Macaro et al. (2018) concluded that there was inadequate data to assess the efficacy of EMI for English language learning.

Studies have attempted to delve into content learning in EMI programs, notably in terms of English proficiency as a determinant of performance (Rose et al., 2019; Xie & Curle, 2022). English skills and academic English performance, as assessed by students' TOEIC academic

results and final grades in an ESP course, were significant indicators of content learning performance in EMI courses, according to a study released in Japan by Aizawa et al. (2023) and Rose et al. (2019). English competence was also proven to be an indicator of success for EMI business students in China by Xie and Curle (2022). These studies demonstrate that students' English proficiency levels are intimately linked with their academic accomplishments in EMI courses. Admittedly, the research is confined to Chinese and Japanese business students, and more research is necessary to completely comprehend the nature of this correlation in various settings and academic subjects.

Whereas studies on language and content learning in EMI programs have shown contradictory data demonstrating the value of EMI, a great deal of evidence suggests that students in EMI programs encounter language-related obstacles (Galloway & Ruegg, 2020). Addressing and responding to questions, understanding English lectures, and comprehending discipline-specific terminology are among the language-related issues apparently encountered by EMI students. Previous research has revealed that EMI instructors reduce content to increase students' understanding of lessons and that EMI results in decreased levels of classroom engagement than when the L1 is utilized as the medium of instruction (Beckett & Li, 2012). Numerous research projects have brought to light students' difficulties in EMI classrooms (e.g., Macaro, 2018; Sameephet, 2020).

Assessment in Language Education

Assessment has been a significant focus in the realm of language education within the context of a classroom (Chinda et al., 2022, p. 525). Assessment is generally a collection of procedures used to gather data on students' performance. It contains quantitative and qualitative descriptions. According to Reynolds et al. (2010), assessment in educational contexts refers to various methods or tools instructors use to assess students' learning performance. Traditional tests, particularly standardized tests developed by testing companies and administered for students, are frequently used in assessments. Educators, on the other hand, employ a wide range of assessment methods to assess students' learning progress. Instructors typically use assessments in specific aspects of learning, such as students' prior knowledge and content knowledge gained after learning.

In language education, assessment refers to finding information to judge students' knowledge of and ability to use a language (Chapelle et al., 2019). Some believe the terms 'testing' and 'assessment' are interchangeable. However, many people use the latter term to include formal measurement tools that generate quantitative scores and other types of qualitative assessment, such as observation, journals, and portfolios (Davies et al., 1999). The process of making inferences about students' language capacity based on observed performance is what connects the various tests and assessments.

Assessment plays a vital role in the teaching and learning process since it serves as a communication tool between the educational sector and the rest of society (Broadfoot & Black, 2004). Instructors can classify and grade their students, provide feedback, and structure their instruction based on assessment. Indeed, assessment is an essential component of teaching. Assessment informs and improves ongoing learning. It not only informs day-to-day instructional decisions and assists in diagnosing student strengths and weaknesses related to classroom instruction, it also provides specific feedback and suggests relevant academic support to facilitate students' learning. Thus, assessment serves as a tool to drive the success of the learning process.

Because EMI is a high investment learning program, it is essential to ensure that the success of EMI can be measured by employing a more direct assessment to reveal the efficacy of the course and observe learning developments for competency comprehension. Notwithstanding, the role of assessment in EMI learning has been largely unexplored.

Controversial Issues in EMI Assessment

There is tension between language and content in the EMI assessment. Most studies highlight that English proficiency is the strongest predictor of students' comprehension and learning in EMI (Hu et al., 2014). However, there is a dearth of empirical EMI research to prove such assertions. In fact, there is more empirical research on assessment in Content and Language Integrated Learning (CLIL) settings, because CLIL places a stronger emphasis on the dual goals of content and language development. Furthermore, many EMI instructors do not see themselves as language instructors (Airey, 2012; Sameephet, 2020). Thus, assessing students' content knowledge learning in English may pose validity and reliability concerns because students can articulate their information more effectively in their L1 than in English (Gablasova, 2014). Assessment in English may risk underestimating students' actual understanding (Lo & Fung, 2018).

By analyzing over 5,000 questions used in various forms of secondary school assessment in Hong Kong, Lo and Fung (2018) investigated the interaction of cognitive and linguistic demands in CLIL assessment. The data demonstrated that as the language difficulty of the assessment task grew, students' academic performance dropped. Shaw and Imam (2013) conducted another investigation in a secondary school setting. They looked at the language requirements in a high-stakes English-medium exam for secondary school students. They discovered that to succeed in English-medium assessment, students needed adequate academic English skills, and increased competence gave them an advantage in developing arguments needed for higher grades. On the other hand, Shaw and Imam determined that students' poor results were due more to a lack of subject-matter understanding than language-related issues. In the CLIL/EMI evaluation, these findings revealed a complex link between language skills and content knowledge.

While the preceding research suggests that increased language competence aids students in reflecting their actual academic knowledge in assessments, it is unclear how these findings could apply to university-level EMI environments, which often do not contain language learning objectives. Through survey results and interviews, Kao and Tsou (2017) investigated EMI instructors' assessment practices in Taiwanese universities, and the findings revealed that EMI instructors primarily used assessment tools such as written final examinations, term projects, and in-class quizzes to evaluate students' content comprehension. Instructors reported a variety of methods in EMI assessment to help students cope with language-related issues, including code-switching, visual assistance, and peer collaboration.

Assessment seems to be the most critical step in the process of determining the effectiveness of EMI implementation because it allows instructors to decide whether their instruction resulted in the desired learning outcomes. However, the details of assessment in EMI contexts are still largely unexplored, and there is some contention over whether EMI assessment should focus on English or content. These issues drew our attention to the significance of conducting a systematic review of EMI assessment in educational settings.

Methodology

The Systematic Review Process

To ensure that the systematic review would proceed rigorously and logically, we adopted Macaro et al.'s (2018) five principles of a systematic review as shown below:
1. More than one reviewer is always involved in a systematic review.
2. From the beginning to the end, a systematic review follows clear guidelines. An initial protocol or agreement among the members of the review team specifies how the review will be conducted.
3. A systematic review includes studies found through an exhaustive and highly reliable search process.
4. A systematic review attempts to minimize reviewer bias.

5. A systematic review aims to produce syntheses that convey clear messages about the reliability of the evidence examined.

The primary purposes of this systematic review were to investigate the objectives of assessment in EMI contexts and to explore the roles and tools of assessment in EMI programs worldwide. To facilitate our study, we started the systematic review process by addressing the following research questions:

(1) Do content instructors assess content or language in EMI classrooms?
(2) How do content instructors assess content and/or language in EMI classrooms?

Search Strategy and Review Protocol

We began the systematic review protocol flow by deciding on keywords to search for relevant studies, followed by screening the title of the articles. Next, the abstract of each piece was reviewed, and we examined the full text. Finally, we independently read each paper in depth and completed a data extraction form. The completed forms were then compared by all reviewers to address any differences discovered.

The database included ERIC, SCOPUS, ProQuest Dissertations and Theses, and Book citation index. We searched for the works of literature with keywords "EMI assessment" and "Assessment in EMI". Only a smattering of EMI assessment research was published and found, so we included the keyword "English medium instruction" to expand the discovery. Then we exclusively screened each article and paper's content vis-à-vis EMI assessment.

Inclusion/Exclusion Criteria

We included relevant studies in this systematic review according to the combined criteria. The studies must be based on empirical data and carried out in contexts where English is used as the instructional language. Those research sites were educational settings where English is not the first language of the majority of the population. Target stakeholders are researchers, lecturers, and students. EMI secondary and higher education are the targeted levels. Book chapters containing empirical studies that are not duplicated in journal articles and were published between 2012 and 2022 were included.

Studies were excluded if they met any of the following criteria: other systematic reviews, or meta-analyses; research that targeted students majoring in English; those carried out in contexts outside the classroom, or carried out in contexts that did not employ English as a medium of instruction.

The keyword search provided 81 possible studies. The abstracts were reviewed through the application of the inclusion and exclusion criteria. Thus, an in-depth review of 13 articles in various regions met the inclusion criteria for this study. An additional four books which responded to the inclusion criteria were also incorporated.
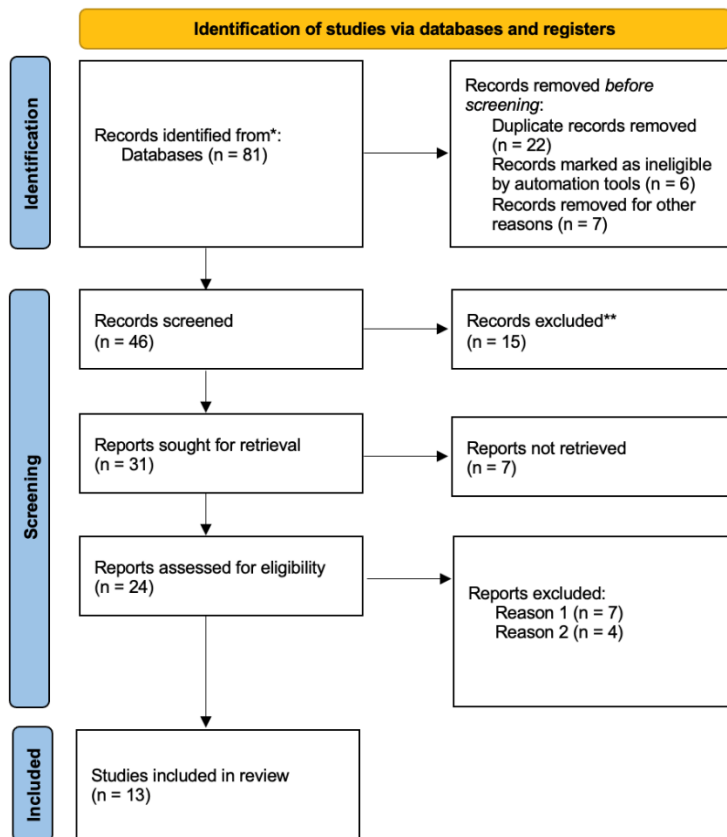
PRISMA Flow Diagram

The PRISMA flow diagram (Page et al., 2021) provides a concise summary of the screening process. After noting the number of articles found, the selection process was made clear by reporting on the decisions made throughout the systematic review. The number of articles is indicated for each level. The reasons for missing articles should always be explained when doing so at the full-text stage. The reviewers' approach for locating available data on the issue and their reasoning for choosing whether to include them in the review is visually depicted in a PRISMA flow diagram. A PRISMA diagram allows the reader to quickly and easily see how many studies were screened, how many were included, and what exclusion criteria were used.

We employed a PRISMA Flow Diagram to visually summarize the critical appraisal of published studies against inclusion and exclusion criteria to include appropriate studies in this systematic review.

Figure 1

PRISMA Flow Diagram (Page et al., 2021)

The PRISMA flow diagram illustrates the screening process for the inclusion and exclusion of studies in this systematic review. A total of 81 studies were initially identified through keyword searches. After applying the inclusion and exclusion criteria, 35 studies were excluded as they did not meet the predefined criteria. The remaining 46 studies underwent further screening, and their full texts were carefully examined. Of these, 25 studies were deemed irrelevant and were subsequently excluded from the review. Ultimately, 13 studies met all the inclusion criteria and were included in the analysis (see Appendix A).

Findings and Interpretations

This section is divided into two themes based on the analysis of the data: the important aspects are the type of test and the focus of the assessment.

Assessing Language and Content

Based on statistical data emerging from the systematic review, we can answer the research question about content instructors' assessment practices in EMI classrooms. We found out which country's institutions commonly used assessment to evaluate the English proficiency, or the content comprehension of students, or both, as shown in tabular form.

Table 1

Assessment Objectives in EMI Contexts Used in Each Country

No.	Countries	Number of studies			Total
		English proficiency	**Content comprehension**	**Both**	
1	Cambodia	-	-	1	1
2	China	1	1	-	2
3	Indonesia	-	1	-	1
4	Japan	1	-	-	1
5	Korea	-	1	-	1
6	Spain	1	-	1	2
7	Taiwan	-	-	2	2
8	Thailand	-	1	-	1
9	Turkey	-	-	1	1
10	Vietnam	1	-	-	1
	Total	**4**	**4**	**5**	**13**

Table 1 illustrates a total number of 13 studies in 10 countries employing English proficiency and content comprehension assessments. Four studies identify that assessment in EMI contexts are mainly employed to measure English skills, four more studies are utilized to evaluate content comprehension, and five studies are used to assess both.

Assessing English Through Formative and Summative Assessments

Formative Assessment of English skills

Data revealed that content instructors used formative assessments to determine their students' English skills. In some contexts, formative assessment is viewed as the fundamental conceptualization of the learning process. That is, it allows learning to be visible to students, and the practice of assessment for learning has the impact of helping students solve difficulties they may encounter while learning in an EMI environment. Table 2 shows formative assessment tools which assess English skills in EMI contexts.

Table 2

Formative Assessment Tools

Countries	Assessment tools	Time
Taiwan	- Group/pair hands-on activities - CEFR	During the course

Countries	Assessment tools	Time
Japan	- VLT/ LVLT - Self-rated vocabulary	During the course
Cambodia	- Oral presentation	Ongoing assessment
Vietnam	- Self-assessment	During the course

During the course, students' English proficiency can be assessed through classroom activities and tasks, and techniques used by instructors are varied. Li and Wu (2018) revealed that students in Taiwanese contexts were assigned to participate in group and pair hands-on activities to display the academic knowledge they had acquired. Standardized tests by CEFR levels are employed as an ongoing assessment tool inspecting the improvement of English. In Japan, a study by Uchihara and Harada (2018) found there were many formative assessment tools to assess English skills in a class such as Vocabulary Levels Test (VLT), Listening Vocabulary Levels Test (LVLT), and self-rated vocabulary lists to investigate the gains in vocabulary volume. In Cambodia, Moore (2017) revealed that instructors assigned oral presentations as a formative assessment to promote English skills. In Vietnam, a study conducted by Tran et al. (2021) mentioned that self-assessment is employed for students to reflect on their level of satisfaction with their language skills. This self-assessment is believed to help promote students' language skills.

According to Li and Wu (2018), instructors provided formative assessments to their students while scaffolding and correcting students' language errors during the evaluation of their English performance. Proficiency was assessed through essays, individual class participation, group and pair class participation, and group and pair hands-on activities. Since English was included as a focus of the assessment, most of the instructors required students to perform these tasks in English, with no allowance for the use of their L1. Although the central idea of formative assessment is to engage students during the learning process, data reflected that fewer classroom interactions were emphasized to promote learning. Many instructors did not often provide students the English language support to accommodate communication. But they allowed students to use the L1 to ask and answer questions to avoid students' English-related problems. Data among selected studies demonstrated that formative assessment is often used when content instructors appraise the English skills of students while they are learning, and this form of evaluation has been neglected in many EMI programs.

Summative Assessment of English Skills

According to research paper analysis across thirteen contexts, data showed abundant evidence of summative assessment implementation to assess students' English skills at the end of the course. Examples are presented in Table 3.

Table 3

Summative Assessment Tools

Countries	Assessment tools	Time
Spain	- Essay - Oxford Placement Test (OPT)	Onset of their degree program (year-1 then year-3)
Cambodia	- Written assignment - Listening test - Gap fill and Multiple Choice questions (MCQs)	End of the course

Countries	Assessment tools	Time
	- Grammar and structure	
Taiwan	- Written final examinations - Term projects - Quizzes	End of the course
China	- The national standardized College English Test Band 6 (CET 6)	End of sophomore year

Although summative assessment aims to evaluate students' content knowledge, many content instructors also paid attention to English used in students' tests and final term papers. At a major university in Spain, Vidal and Jarvis (2020) conducted a study in which they analyzed essays written by 99 first-year and 96 third-year undergraduate students to investigate the effect of three years of EMI on their level of proficiency, essay quality, and lexical diversity using the criteria of the Oxford Placement test, the CEFR writing scale, and three lexical diversity measures. An independent-samples t-test was used to determine whether students' written lexical variety increased after three years of English instruction.

Similarly, in China, Lei and Hu (2014) investigated potential long-term EMI effects on students' English proficiency as measured by the national standardized College English Test (CET). Students were required to take CET 4 at the end of their freshman year and CET 6 at the end of their sophomore year.

In Cambodia, Moore (2017) investigated EMI language testing policies and practices through interviews, a focus group, and document analysis. The study discovered that, despite differences between the various subjects in the EMI curriculum, their assessment practices of English skills conformed strongly to the institutional norm for all subjects, such as using oral presentations, written assignments, listening tests, gap fills, MCQs, and grammar and structure.

At other universities, content instructors provided corrective feedback to students after final exams. For example, the exploratory study of assessment in EMI courses conducted by Li and Wu (2018) found that feedback is crucial for students to reflect on their thoughts and practices. All instructors acknowledged that students' performance was inevitably affected by their English skills. To support the students, instructors would provide extra materials for those who needed to improve their English skills.

In Taiwanese universities, Kao and Tsou (2017) investigated content instructors' assessment practices through survey results and interviews, and the findings revealed that EMI instructors mostly employ summative assessment tools such as written final examinations, term projects, and quizzes to evaluate students' content learning. Instructors mostly focused on how students use the English language in the assessment. In contrast, there were some instructors who concentrated on the content only.

There is a controversy about whether English should be incorporated in the assessment criteria. Some instructors from the medical science discipline regarded English ability as an integral part of the medical profession and included English communicative competence in the assessment criteria. Other instructors reported that students' English skills are not evaluated because the focus of the curriculum is academic knowledge.

Assessing Content through Formative and Summative Assessments

Formative Assessment of Content Comprehension

Data from several contexts indicated that content instructors used formative assessments to measure students' content comprehension. They also used diverse formative assessment tools. Table 4 shows formative assessment tools used to assess content knowledge in EMI contexts.

Table 4

Formative Assessment Tools

Countries	Assessment tools	Purposes
Cambodia	- Homework - Class participation - Quizzes - Progress test - Revision test - Oral presentation - Written assignment	To drive students to consolidate what they have studied
Indonesia	- Self-sitting exercises - Quizzes	To give students experience with the most efficient learning methods, models, and approaches to assist them in achieving the stated learning objectives in the syllabus

Taking a close look at Moore's study (2017), three classes (i.e., Core English, Literature Studies, and Global Studies) in the BEd (TEFL) program were evaluated for a total of 50 percent of their semester score, as shown in Table 5.

Table 5

Ongoing Assessment in Core English, Literature Studies, and Global Studies classes

Core English (% of semester score)	Task types	Literature studies (% of semester score)	Task types	Global studies (% of semester score)	Task types
5	Homework	5	Homework	5	Homework
5	Quizzes	5	Class participation	5	Quizzes
20	Progress tests (x2)	20	Progress tests (x2)	20	Revision tests(x2)
10	Listening (x2)	10	Oral presentation	10	Oral presentation
10	News reporting	10	Written assignment	10	Written assignment
50		50		50	

Content instructors deployed higher-order thinking questions in formative assessments to drive students to consolidate what they had studied to solve new issues and address real-world problems. Content instructors included not only skill and knowledge criteria (i.e., projects, tests, assignments), but also self-assessment, classroom behavior and attitude, effort, attendance, participation, and extracurricular activities (Li & Wu, 2018). Self-sitting exercises and Quizzes were also employed in the classroom to expose students to the teaching approaches that are the most effective in assisting them to meet the syllabus's outlined learning goals (Marsaulina, 2019). Self-assessment can motivate students to participate in learning (Black & William, 2009; Dann, 2014). Students can set their own goals and improve learning strategies to achieve those goals.

To check students' content comprehension, English proficiency does not need to be examined, with the assessment focus directed solely on the content (Rubio & Perea, 2021). As claimed by Mancho-Barés and Aguilar-Pérez (2020), Content instructors agreed that their

instruction emphasis is content rather than language, as other studies demonstrated (Wilkinson, 2013).

Summative assessment of content comprehension

Data suggested that summative assessment was mainly used across contexts to assess students' content comprehension. Content instructors believed that summative assessment is an effective tool to indicate EMI outcomes. Table 5 shows common assessment tools employed to assess content knowledge.

Table 5

Summative Assessment Tools

Countries	Assessment tools	Purposes
Taiwan	- Project written final test, - Quizzes - Assignments	To evaluate content knowledge
Thailand	Written test	To assess mathematical knowledge
China	United states medical licensing examination (USMLE)	To assess students' content comprehension
Turkey	- Open-ended questions in examination papers - Projects	1.To test engineering knowledge 2. To evaluate engineering knowledge
Korea	- Pre-test - Post-test	1. To assess prior knowledge on the current lecture 2. To determine comprehension of the lecture

There is a lack of specific criteria in EMI summative assessment because content instructors mostly employ the identical assessment criteria for the same courses conducted in the L1. Many do not use rubrics in classroom activities. Kao and Tsou (2017) reported that many content instructors used multiple summative assessment tools to evaluate content knowledge such as projects, written final tests, quizzes, and assignments. These summative assessments are used to assess students' performance at the end of the module of teaching by comparing outcomes across a group of students or against a set of criteria. Summative assessments are written form tests that are given at the end of the learning process (Moore, 2017).

Other studies illustrated how summative assessment is planned and performed in EMI classrooms. For example, Sahan and Șahan (2021) reported that engineering instructors in Turkey generally used open-ended questions to evaluate students' content comprehension performance in midterms and final exams. Once students began their internships in their final year, some instructors chose to use projects as assessment instruments rather than exams.

According to the study of Waswa (2020), grade 8 Thai students who were studying in an EMI program were given a comprehensive mathematics written exam on three units: percentages, ratios and proportions, and transformations. The test was given in both English and their native Thai language. This shows that students' content knowledge was assessed at the end of the course. The possible reasoning for this is that academic performance as a total score, including assignments, attendance, and a final examination can present a more comprehensive view of the effectiveness of EMI learning outcomes.

In addition, Yang et al. (2019) investigated the challenges and adaptation strategies of teachers and students in an EMI medical education program in China. They indicated that the United States Medical Licensing Examination (USMLE) was employed to access the medical students' comprehension and to evaluate the EMI learning outcomes.

Above all, summative assessment is widely considered a significant instrument for indicating student success at acquiring content knowledge in EMI classrooms. That is why summative assessment plays the main role over formative assessment (Otto & Estrada, 2021).

Discussion

Assessments are usually used to assess English proficiency and content comprehension of EMI students across 13 existing studies from 10 countries. Unsurprisingly, the findings confirmed that content instructors measured both English skills and content knowledge. These findings are consistent with those of Rose et al. (2019) who identified that English language competency and academic English performance were significant indicators of performance in EMI academic subject courses. For EMI business students, English proficiency has also been shown to be a predictor of success (Xie & Curle, 2022). Additionally, language acquisition occurs as an unintentional or unanticipated consequence of using English as a tool for transferring subject knowledge. However, according to Brown and Bradford (2017), EMI is primarily concerned with subject mastery rather than language, even though it may include features of language sensitivity and support. As a result, subject content has a significant influence on the success and the quality of EMI.

Nevertheless, the findings demonstrated that most institutions have emphasized the assessment of English proficiency over content comprehension. Consequently, EMI assessments have yielded contradictory practices since EMI pays attention to academic subject matter. Logically, content knowledge should be tested more that the English language. The findings presented a picture of EMI students whose comprehension was hindered by their deficient English skills. In accordance, previous studies of Galloway and Ruegg (2020) have found copious evidence of language-related challenges facing EMI students. In order to boost their understanding, many EMI instructors have to minimize content and classroom engagement when the L1 is not used as the medium of instruction. To measure language and/or content, content instructors need to ensure that they follow the policy of each institution, curriculum, and syllabus.

The findings demonstrated that content instructors deployed formative and summative assessments to measure English skills and content knowledge of students. In EMI classrooms, formative assessment focuses on assessment *for* learning while summative assessment centers on assessment *of* learning. Content instructors utilized formative assessment as a systematic process to gather evidence about learning on a continuous basis. English proficiency takes priority over content evaluation during formative assessment. Even though EMI is more concerned with content knowledge, the learning process is conducted in English. Therefore, English proficiency plays an important role in evaluating how the program needs to be improved. A standardized assessment, such as the CEFR, is used as a tool for ongoing assessment and problem identification to provide appropriate language support and promote students' competency in effectively using English in the learning process. This possibly explains why more research is being done on English proficiency rather than content knowledge in formative assessment.

Ongoing learning content is used to determine EMI students' current level of learning and to adapt lessons to assist them in reaching the desired learning goals. In principle, students usually participate actively with their instructors in formative assessment, sharing learning objectives and understanding how their learning is progressing, what next steps they need to take to improve, and how to take these steps. In practice, many EMI students were unable to do so due to inadequate English skills. The findings suggested that content instructors used formative assessment to conceptualize learning processes and assist students in overcoming difficulties in learning from EMI.

Summative assessments, as opposed to formative tests, provided data for determining the overall effectiveness of EMI learning. Content instructors implemented summative assessments to measure the English skills and content knowledge of EMI students. Even though EMI uses English as the primary language for instruction, the key result that indicates success is students'

content knowledge. Therefore, several studies have focused on assessing student content knowledge in summative assessments rather than their progress with the use of the English language. A possible explanation for this practice is that summative assessment is an accumulated assessment that endeavors to capture what a student has learned, or the quality of the learning, and grade their performance against specified standards. It typically takes the form of high-stakes tests that are used to determine how much learning has occurred, or how much a student knows. This type of assessment is almost always graded, occurs at the end of sections of instruction, and includes final exams, final projects, and term papers. So, summative assessment helps content instructors in grading and judging the performance of EMI students to measure the quality of EMI learning.

The findings reveal that summative assessments are prioritized for content comprehension over English Proficiency. Since the EMI class is conducted in English, several studies aim to investigate post-lesson the students' effectiveness in acquiring content knowledge. The summative assessments are sometimes called final examinations, and the tasks are varied, including written exams, quizzes and even projects. A lack of clarity in the assessment policy emerges when one critically reviews the tools and strategies used as assessments to ascertain students' ability in both language proficiency and content comprehension. This often depends on the instruments with which their instructor is familiar, and this familiarity thereby determines the types of assessments used during class. Rather than choosing tasks which were more appropriate for the instructional objectives, assessment techniques were more frequently selected because the instructors felt more comfortable applying them. Most of the instructors acknowledged that they were not skilled in choosing or generating an appropriate assessment method. Surprisingly, none of the existing studies reported the use of a rubric in either formative or summative assessment. A rubric is an evaluation instrument that explicitly outlines accomplishment standards for all parts of any type of student work, including written, oral, and visual components. Rubrics may be used to assess homework, record class participation, and calculate final grades.

In a nutshell, in formative assessment, English proficiency assessment continues to take priority over content knowledge even though EMI students are not always competent enough to understand the content in English. However, the main indicators of EMI success are the content knowledge that students gain; English proficiency is simply a by-product of presenting the learning content in English. To satisfy these indicators, in summative assessment, the evaluation of content knowledge takes priority over English proficiency.

Conclusion

This systematic review revealed that there is still insufficient evidence to determine whether English proficiency or content knowledge should be prioritized in EMI assessment. Either way, English proficiency and content comprehension assessments are vital elements in formative and summative evaluation. Formative assessment was used to assess students' learning progress. The assessment instruments used to evaluate students' content comprehension are usually similar to those used in the L1 program such as quizzes, multiple choice exercises, short answer questions, and so on, (Kao & Tsou, 2017) but they are in English. Thus, this finding supports Dearden's (2014) affirmation that students' English proficiency is likely to have an impact on their performance.

Summative assessment was used to determine what students had learned and to evaluate the effectiveness of the learning and teaching processes. Summative assessment of students involved various types of tests such as written tests, project presentations, and final exams to assess their knowledge. These findings highlighted the factors that the instructor must consider when implementing an assessment in an EMI program to effectively assess the performance of students and the quality of the program.

To answer the following difficult questions: Do content instructors assess content or language in EMI classrooms? And how do content instructors assess content and/or language in

EMI classrooms? In practice, the instructors may hold the mindset that they assess what they teach following the content-based syllabus and teach necessary knowledge and skills that help their students achieve the goal of learning the content in English. It is appropriate to assess academic content. However, it is questionable whether assessing language is relevant because content, not language, is the central requirement in the syllabus. There are many assessment tools available to assess the student's comprehension, from group presentations to final exams.

This systematic review can be used as a resource for EMI stakeholders involved in selecting appropriate assessments for different purposes in EMI programs. From a methodological standpoint, this study highlights a variety of research instruments and tools that can be used to investigate EMI assessment. According to the findings, most research instruments are questionnaires, interviews, and focus groups; few researchers have used classroom observation, discussions with stakeholders, or explorations of test procedures to collect richer data in more natural settings. The information presented here could help researchers who are interested in investigating EMI assessment to choose the proper instruments. Finally, this review could raise awareness among policymakers of the importance of providing explicit EMI assessment guidelines or, if possible, considering a collaboration to create a global standard for EMI assessment to enhance the quality of these programs. Furthermore, policymakers could benefit from an enhanced awareness of the value of supporting stakeholders' training and promoting professional development as critical elements in improving EMI assessment.

Further research could collect more fruitful data in actual settings by expanding research targets to include classroom observations, interviews, focus groups, and examinations of test procedures. More research could be conducted to determine how to assess EMI students' content knowledge, as this area has yet to receive much attention. Conducting a longitudinal study or ongoing research to see the improvement of students' English skills and academic content comprehension in EMI programs would be greatly beneficial to EMI implementation. Improvements are needed and this would be an important lens through which to examine the impact of the washback of EMI assessments in classroom settings in different contexts.

About the Authors

Thanakrit Thippayacharoen: A Master of Arts in English student at the Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand. His research interests are Assessment Literacy and Practices and EMI.

Chonlatee Hoofd: A Master of Arts in English student at the Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand. Her research interests include Global Englishes and EMI.

Napat Pala: A Master of Arts in English student at the Faculty of Humanities and Social Sciences, Khon Kaen University, Thailand. His research interests include EMI and Discourse Analysis.

Banchakarn Sameephet: An EMI Instructor in the English Language Department, Faculty of Humanities and Sciences, Khon Kaen University, Thailand. His research interests are EMI, Translanguaging, and Global Englishes for Language Learning.

Bhirawit Satthamnuwong: A lecturer at the English Language Department, Faculty of Humanities and Social Sciences, Khon Kaen University. He has experience in researching into and training teachers in curriculum development and implementation, and English medium education. His research areas and interests are English medium instruction/education, Global Englishes, language beliefs and ideology, and English language teaching.

References

Airey, J. (2012). I don't teach language. *The linguistic attitudes of physics lecturers in Sweden. AILA Review*, *25*(25), 64-79.

Aizawa, I., Rose, H., Thompson, G., & Curle, S. (2023). Beyond the threshold: Exploring English language proficiency, linguistic challenges, and academic language skills of Japanese students in an English medium instruction programme. *Language Teaching Research*, *27*(4), 837–861.

Beckett, G., & Li, F. (2012). Content-based English education in China: Students' experiences and perspectives. *Journal of Contemporary Issues in Education*, *7*(1), 47-63.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, *21*, 5-31.

Broadfoot, P., & Black, P. (2004). Redefining assessment? The first ten years of assessment in education. *Assessment in Education: Principles, Policy & Practice*, *11*(1), 7-26.

Brown, H., & Bradford, A. (2017). EMI, CLIL, & CBI: Differing approaches and goals. In P. Clements, A. Krause, & H. Brown (Eds.), *Transformation in language education*. JALT.

Byun, K., Chu, H., Kim, M., Park, I., Kim, S., & Jung, J. (2011). English-medium teaching in Korean higher education: Policy debates and reality. *Higher Education, 62*(4), 431-449.

Chinda, B., Cotter, M., Ebrey, M., Hinkelman, D., Lambert, P., & Miller, A. (2022). Reactions of teachers and students towards the implementation of performance-based language assessment: A washback study in Hokkaido, Japan. *LEARN Journal: Language Education and Acquisition Research Network*, *15*(1), 524-547.

Chapelle, C. A., Kremmel, B., & Brindley, G. (2019). *Assessment in an introduction to applied linguistics*. Routledge.

Curle, S., Jablonkai, R., Mittelmeier, J., Sahan, K., & Veitch, A. (2020). *English Medium Part 1: Literature review*. In N. Galloway (Ed.), English in higher education (Report No. 978-0-86355-977–8). British Council. 1-75.

Dafouz, E., & Smit, U. (2014). Towards a dynamic conceptual framework for English-medium education in multilingual university settings. *Applied Linguistics, 37*(3), 397–415.

Dafouz, E., & Smit, U. (2020). *ROAD-MAPPING English medium education in the internationalized university*. Palgrave Macmillan.

Davies, A., Brown, A., Elder, C., Hill, K., Lumley, T., & McNamara, T. (1999). *Dictionary of language testing*. Cambridge University Press.

Dearden, J. (2014). *English as a medium of instruction - a growing global phenomenon*. British Council.

Deng, L. & Wannaruk, A. (2021). A contrastive study of rhetorical move structure of English medium instruction lectures given by native English and Chinese lecturers. *LEARN Journal: Language Education and Acquisition Research Network*, *14*(2), 451-477.

Fenton-Smith, B., Humphries, P., & Walkinshaw, I. (2017). *English medium instruction in higher education in Asia Pacific: From policy to pedagogy*. Springer.

Gablasova, D. (2014). Issues in the assessment of bilingually educated students: expressing subject knowledge through L1 and L2. *The Language Learning Journal, 42*(2), 151-164.

Galloway, N., & Ruegg, R. (2020). The provision of student support on English Medium Instruction programmes in Japan and China. *Journal of English for Academic Purposes*, *45*, 100846.

Hu, G., Li, L., & Lei, J. (2014). English-medium instruction at a Chinese university: Rhetoric and reality. *Language Policy*, *13*(1), 21–40.

Joe, Y., & Lee, H. K. (2013). Does English-medium instruction benefit students in EFL contexts? A case study of medical students in Korea. *The Asia-Pacific Education Researcher*, *22*, 201-207.

Kao, Y. T., & Tsou, W. (2017). EMI course assessment: A survey study of the issues. In W. Tsou & S. Kao (Eds), *English as a medium of instruction in higher education: Implementations and classroom practices in Taiwan* (pp. 183–205). Springer.

Lasagabaster, D. (2022). *English-Medium instruction in higher education*. Cambridge University Press.

Lei, J., & Hu, G. (2014). Is English-medium instruction effective in improving Chinese undergraduate students' English competence? *International Review of Applied Linguistics in Language Teaching*, *52*(2), 99-126.

Li, N., & Wu, J. (2018). Exploring assessment for learning practices in the EMI classroom in the context of Taiwanese higher education. *Language Education & Assessment, 1*(1), 28-44.

Lo, Y. Y., & Fung, D. (2018). Assessments in CLIL: The interplay between cognitive and linguistic demands and their progression in secondary education. *International Journal of Bilingual Education and Bilingualism, 23*(10). 1192-1210

Macaro, E. (2015). English medium instruction: Time to start asking some difficult questions. *Modern English Teacher*, *24*(2), 4–7.

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language Teaching*, *51*(1), 36–76.

Macaro, E. (2018). *English medium instruction*. Oxford University Press.

Mancho-Barés, G., & Aguilar-Pérez, M. (2020). EMI lecturers' practices in correcting English: Resources for language teaching? *Journal of immersion and content-based language education*, 8(2), 257-284.

Marsaulina, R. M. (2019, June). Web 2.0 Technology Integrated Personalized Learning in a CLT for EAP at least CEFR Level B2. In *Conference Proceedings. The Future of Education 2019*.

Moncada-Comas, B., & Block, D. (2021). CLIL-ised EMI in practice: Issues arising. *The Language Learning Journal, 49*(6), 686-698.

Moore, S. H. (2017). A case study of assessment in English medium instruction in Cambodia. In B. Fenton-Smith, P. Humphreys & I. Walkinshaw, (Eds), *English Medium Instruction in Higher Education in Asia-Pacific. Multilingual Education* (pp. 173-191). Springer.

Otto, A., & Estrada Chichón, J. L. (2021). Analysing EMI assessment in higher education. *Revista Tempos e Espaços em Educação*, *14*(33), 1-11.

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., Mcdonald, S., Mckenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *Research Methods and Reporting*, *372*(160), 1-36.

Reynolds, C. R., Livingston, R. B., Willson, V. L., & Willson, V. (2010). *Measurement and assessment in education*. Pearson Education International.

Rose, H., Curle, S., Aizawa, I., & Thompson, G. (2019). What drives success in English medium taught courses? The interplay between language proficiency, academic skills, and motivation. *Studies in Higher Education, 45*(11), 2149-2161.

Rose, H., McKinley, J., Xu, X., & Zhou, S. (2020). *Investigating policy and implementation of English medium instruction in higher education institutions in China*. British Council.

Sahan, K., & Şahan, Ö. (2021). Investigating student and alumni perspectives on language learning and career prospects through English medium instruction. *Teaching in Higher Education*, 1-22.

Sameephet, B. (2020). On the fluidity of languages: A way out of the dilemma in English medium instruction classrooms in Thailand [Doctoral thesis, The University of Waikato]. The University of Waikato Research Commons. https://hdl.handle.net/10289/13498

Shaw, S., & Imam, H. (2013). Assessment of international students through the medium of English: Ensuring validity and fairness in content-based examinations. *Language Assessment Quarterly, 10*(4), 452-475.

Talaue, F. G., & Kim, M. K. (2020). Investigating the advantages of English medium instruction (EMI) in the Indonesian workplace. *LEARN Journal: Language Education and Acquisition Research Network*, *13*(2), 321-334.

Tran, T. H. T., Burke, R., & O'Toole, J. M. (2021). Perceived impact of EMI on students' language proficiency in Vietnamese tertiary EFL contexts. *IAFOR Journal of Education*, *9*(3), 7-24.

Uchihara, T., & Harada, T. (2018). Roles of vocabulary knowledge for success in English-medium instruction: Self-perceptions and academic outcomes of Japanese undergraduates. *Tesol Quarterly, 52*(3), 564-587.

Unterberger, B., & Wilhelmer, N. (2011). English-medium education in economics and business studies: Capturing the status quo at Austrian universities. *ITL-International Journal of Applied Linguistics, 161*(1), 90-110.

Vidal, K., & Jarvis, S. (2020). Effects of English-medium instruction on Spanish students' proficiency and lexical diversity in English. *Language Teaching Research*, 24(5), 568-587.

Wächter, B., & Maiworm, F. (Eds.). (2014). *English-Taught Programmes in European Higher Education: The State of Play in 2014*. Lemmens.

Waswa, D. W. (2020). The effects and implications of the use of English as a medium of instruction in mathematics on Thai learners. *International Journal of Social Sciences & Educational Studies, 7*(2), 89-107.

Wilkinson, R., & Zegers, V. (2006). Assessing incipient linguistic competences: an institutional perspective. In Wilkinson, R., Zegers, V. & van Leeuwen, C. (Eds.). *Bridging the Assessment Gap in English-Medium Higher Education* (pp 61-76). AKS-Verlag.

Wilkinson, R. (2013). English-medium instruction at a Dutch university: Challenges and pitfalls. *English-medium instruction at universities: Global challenges*, 324(10.21832), 9781847698162-005.

Xie, W., & Curle, S. (2022). Success in English Medium Instruction in China: Significant indicators and implications. *International Journal of Bilingual Education and Bilingualism*, 25(2), 585-597.

Yang, W. (2015). Content and language integrated learning next in Asia: Evidence of learners' achievement in CLIL education from a Taiwan tertiary degree programme. *International Journal of Bilingual Education and Bilingualism, 18*(4), 361–382.

Yang, M., O'Sullivan, P. S., Irby, D. M., Chen, Z., Lin, C., & Lin, C. (2019). Challenges and adaptations in implementing an English medium medical program: a case study in China. *BMC Medical Education*, 19, 1-8.

Table 6

Findings of the Reviewed Sources

Authors	Origin	Title	Context of the study	Purpose	Types of sources	Research design	Research instrument	Target participants	Major themes
Joe and Lee (2013)	Korea	Does English-medium instruction benefit students in EFL contexts? A case study of medical students in Korea	Medical program in Korea	To scrutinize relationships among Korean medical students' comprehension of and satisfaction with English-medium lectures and their general English proficiency.	Research article	Case study	1. Test 2. Survey questionnaire	61 medical students	Assessing comprehension of the lecture
Lei and Hu (2014)	China	Is English-Medium Instruction Effective in Improving Chinese Undergraduate Students' English Competence?	Business Administration program at a Chinese university	To study whether the focal EM program influences students' English proficiency.	Research article	Mixed-method research	1. National standardized College English Test Band 4 and 6 (CET4 and CET 6) scores 2. Survey 3. Interview	136 undergraduate students	Investigating whether EMI has an impact on English proficiency and affects English learning and use

Authors	Origin	Title	Context of the study	Purpose	Types of sources	Research design	Research instrument	Target participants	Major themes
Kao and Tsou (2017)	Taiwan	EMI course assessment: A survey study of the issues	Three public, two private, and one vocational university in Taiwan	To document the current situation of how students are assessed in EMI courses in Taiwan.	Book chapter	Mixed-method research	1.Questionnaire 2. Teacher interviews	29 EMI teachers	Exploring the issues of EMI course evaluation in Taiwan (assessment tools, concept of "assessment for learning" in EMI context)
Moore (2017)	Cambodia	A case study of assessment in English medium instruction in Cambodia	EMI courses at a Cambodian university	To investigate language testing policies and practices in Cambodia.	Book chapter	Qualitative research	1. Interviews 2. Focus group 3. Document analysis	1. 2 Admin-istrators 2. 4 Teachers 3. 6 Students	Assessing language testing policies and practices
Uchiha-ra and Harada (2018)	Japan	Roles of vocabulary knowledge for success in English-medium instruction: Self-perceptions and academic outcomes of Japanese undergraduates	School of Education's Department of English Language and Literature at a competitive private university in Tokyo, Japan.	To investigate the relationship between vocabulary knowledge and self-perceptions of four language skills targeting undergraduate students in EMI courses in Japan.	Research article	Mixed-method research	1. Vocabulary measures - Vocabulary Levels Test (VLT) - Listening Vocabulary Levels Test (LVLT) - Self-rated vocabulary 2. Follow-up semi-structured	35 under-graduate students in EMI courses in Japan	1. Comparing three vocabulary measures and perceptions of language use in the EMI courses 2. Comparing these vocabulary measures with academic achievement data

Authors	Origin	Title	Context of the study	Purpose	Types of sources	Research design	Research instrument	Target participants	Major themes
							retrospective interviews		
Li and Wu (2018)	Taiwan	Exploring assessment for learning practices in the EMI classroom in the context of Taiwanese higher education	University in Taiwan	To meet EMI teachers' needs to conduct learning-oriented classroom assessment.	Research article	Quantita-tive research	ECAP questionnaire	40 EMI university teachers in Taiwan	Assessing the frequency of applying a specific assessment practice, skillfulness in the specific assessment technique, the role of English in the EMI classroom, and whether the focus of an assessment task was content, English language, or both.
Marsauli-na (2019)	Indonesia	Web 2.0 Technology Integrated Personalized Learning in CLT for EAP to at least CEFR Level B2	IT institute in a remote area of North Sumatera, Indonesia	To explore blended learning methods for target EAP scores of at least CEFR level B2 that could be adopted by lecturers whose	Research article	Mixed-method research	1. An open questionnaire 2. Semi-structured interview questions	48 technology lecturers	Students were provided self-sitting exercises and quizzes by the instructor

Authors	Origin	Title	Context of the study	Purpose	Types of sources	Research design	Research instrument	Target participants	Major themes
				EAP test scores are below CEFR level B2 due to the barriers.					
Vidal and Jarvis (2020)	Spain	Effects of English-medium instruction on Spanish students' proficiency and lexical diversity in English	Major university in Spain	To investigate the effect of three years of instruction through the medium of English on students' level of proficiency, essay quality and lexical diversity	Research article		1.MTLD, MTLD-W, and MATTR 2. Lemmatization 3. CEFR Writing Scale 4. Oxford Placement Test	195 undergraduate students (99 1st-year and 96 3rd-year learners)	Assessing argumentative essays in English in response to a prompt that had been used on the international TOEFL test.
Yang et al. (2019)	China	Challenges and adaptations in implementing an English-medium medical program: a case study in China	EMI medical education program in China	To investigate the challenges and adaptation strategies of teachers and students in an EMI medical education program in China.	Research article	Mixed-method research	1. Test scores 2. Survey 3. Focus group 4. Discussions	203 Medical students	Assessing in Students content using USMLE scores to measure the effectiveness of EMI

Authors	Origin	Title	Context of the study	Purpose	Types of sources	Research design	Research instrument	Target participants	Major themes
Waswa (2020)	Thailand	The Effects and Implications of The Use of English as a Medium of Instruction in Mathematics on Thai Learners	Thai public schools	To determine the effects, opinions and implications of the use of English in teaching Mathematics in Thai public schools.	Research article	Cross-sectional survey research	1. Question-naires 2. Interview Schedule 3. Written test	141 students and 9 foreign teachers from a government school in Ratchaburi municipality	Assessing content knowledge of mathematics by using a writing test
Tran, Burke and O'Toole (2021)	Vietnam	Perceived Impact of EMI on Students' Language Proficiency in Vietnamese Tertiary EFL Contexts	Six Vietnamese universities	To investigate lecturers' and students' perceptions of the impacts of EMI on students' language proficiency in Vietnam	Research article	Mixed-method research	1. Surveys 2. Interviews 3. Focus groups	1. 360 EMI students (60 students from each selected university) 2. 30 lecturers (5 lecturers from each selected university)	Conducting lecturers, and students' perceptions of the impact of EMI on students' language proficiency.

Authors	Origin	Title	Context of the study	Purpose	Types of sources	Research design	Research instrument	Target participants	Major themes
Sahan and Şahan (2021)	Turkey	Content and Language in EMI Assessment Practices: Challenges and Beliefs at an Engineering Faculty in Turkey	Engineering faculty in Turkey	To explore how lecturers and students perceive the role of language in EMI assessment and describe their own assessment practices.	Book chapter	Qualitative research	1. Interviews 2. Focus groups	University lecturers and students	Examining the relationship between content and language in EMI assessment practices
Otto and Estrada (2021)	Spain	Analyzing EMI assessment in higher education	Medium-sized (i.e., 12,000 students) private university in Madrid, Spain	To analyze how EMI assessment is conducted; the most popular assessment tools used by EMI lecturers; and the role that English as a foreign language plays in EMI teaching.	Research article	Mixed-method research	1. One questionnaire 2. Two focus groups	22 EMI lecturers	Implementing the assessment tools and the role that English as a foreign language plays in EMI teaching